APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,121	01/27/2004	Chengjun Liu	436/5	2115

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EXAMINER
CHEN, WENPENG

ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 08/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/766,121	LIU, CHENGJUN
	Examiner	**Art Unit**
	Wenpeng Chen	2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7/13/2004*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 June 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

Priority

1.   Applicant's statement for domestic priority under 35 U.S.C. 119(e) in the first

paragraph of the specification is acknowledged. Applicant did not claim domestic priority under

35 U.S.C. 119(e) to provisional application 60/446,596 (hereafter referred as '596 application) in

the signed Oath or Declaration on record filed on 6/14/2004.

Drawings

2.   The drawings are objected to because of the following informalities.

-- Fig. 1 filed on 6/11/2004 shall be labeled "Figure. 1." The label is missing.

Correction is required.

Specification

3.   The attempt to incorporate subject matter into this application by reference to

provisional application 60/446,596 in the following sections is improper because the provisional

application will not be published. MPEP 608.01(p) sets the following requirement: "Prior to

allowance of an application that incorporates essential material by reference to a pending U.S. application, the

examiner shall determine if the referenced application has been published or issued as a patent. .... If the referenced

application has not been published or issued as a patent, applicant will be required to amend the disclosure of the

referencing application to include the material incorporated by reference. The amendment must be accompanied by

an affidavit or declaration executed by the applicant, or a practitioner representing the applicant, stating the

amendatory material consists of the same material incorporated by reference in the referencing application."

-- section 0001 that refers to essential material to make the application complete;

-- section 0015 that refers to calculation;

-- sections 0017, 0019, 0020, and 0023 that refer to equations provided in the provisional

application.

Without referring to provisional application 60/446,596, a reader cannot use the claimed

invention. Please note that before this case can be allowed, all the incorporated materials shall be

included in the present application 10/766,121 to make it complete.

Claim Objections

4.   Claims 8-12 are objected to because of the following informalities.

-- For Claims 8-12, the meaning of the symbol "PDF" shall be spelled out explicitly at

least in Claim 8. Appropriate correction is required.

-- For Claims 10-12, the meaning of the symbol "DFA" shall be spelled out explicitly at

least in Claim 10. Furthermore, DFA is an analysis. It is not calculated.

Claim Rejections - 35 USC § 112

5.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
subject matter which the applicant regards as his invention.

6.   Claims 2-7 and 10-12 are rejected under 35 U.S.C. 112, second paragraph, as

being indefinite for the following reasons.

-- For Claims 2-7, the meaning of "discriminating feature analysis (DFA) vector" is not

clearly defined in the specification or the '596 application.

-- For Claims 2-7 and 10-12, there are insufficient antecedent bases for the following

limitations.

-- Claim 2 recites the limitation "the discriminating feature analysis (DFA) vector" in line

2.

-- Claim 10 recites the limitation "the DFA" in line 2.

Claim Rejections - 35 USC § 102

7.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on
sale in this country, more than one year prior to the date of application for patent in the United States.

8.   Claims 8-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Yang et

al. ("Detecting Faces in Images: a Survey," Yang, Ming-Hsuan et al., IEEE Trans. On Pattern

Analysis and Machine Intelligence, v. 24, no. 1, January 2002, pages 34-58.)

Yang teaches a method of classifying an input images as being of a first type or of a

second type, the method comprising:

-- calculating PDF's of images classes of said first type and of said second type using a single multivariate Gaussian PDF,

- wherein said first type is a face and said second type is a nonface; (left column, page 43 teaching two types of image, a face and a nonface; section 2.4.2 from right column, page 43 to left column, page 44 teaching the Gaussian PDF)

-- utilizing said Gaussian PDF's in conjunction with at least one input image to classify said input image as either being of a first type or of a second type; (section 2.4.2 from right column, page 43 to left column, page 44)

-- wherein the PDF's of the face and nonface classes are calculated only after first calculating the DFA of each of a plurality of training images; (DFA being generated at first in section 2.4.2 of right column, page 43, then PDF's being calculated in left column, page 44)

-- wherein a DFA of an input image is calculated and a Bayesian discriminator function is used to process the DFA's of the input image to classify said input image as either a face or nonface; (section 2.4, left column, page 43)

-- wherein said PDF's of the face and nonface classes are calculated during training based upon a sample set of at least several hundred FERET images. (section 3.1, page 49)

Claim Rejections - 35 USC § 103

9.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10.   Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang

et al. ("Detecting Faces in Images: a Survey," Yang, Ming-Hsuan et al., IEEE Trans. On Pattern

Analysis and Machine Intelligence, v. 24, no. 1, January 2002, pages 34-58) in view of Go (US

patent 5,761,341.)

Yang teaches a method of representing an image comprising:

-- obtaining an image; (right column, page 43, section 2.4.2; last paragraph, right column,

page 45)

-- calculating its edge representation and amplitude projections; (last paragraph, right

column, page 45; left column, page 37 and Fig. 3)

-- using the image, edge representation, and amplitude projections as features for face

recognition; (first paragraph, section 2.2.4 "Multiple features; left column, page 43)

-- combining several features for facial recognition. (first paragraph, section 2.2.4

"Multiple features; right column, page 45)

However, Yang does not explicitly teach combining all the image, edge representation,

and amplitude projections as features for face recognition.

It is desirable to improve accuracy of facial recognition. This objective can be achieved

by combining various features as discriminating components. It would have been obvious to one

of ordinary skill in the art, at the time of the invention, to combine all the image, edge

representation, and amplitude projections that appear in different portions of Yang's paper as

features for face recognition because this combination improves accuracy of facial recognition.

Furthermore, however such an obvious extension of Yang's teaching does not teach using

1-D Haar wavelet representation of the image as features for facial recognition.

Go teaches using 1-D Haar wavelet to derive edge images in both vertical and horizontal

directions. (column 7, lines 1-50; Please note that Go's equation in line 5, column 7 is the same

as equation (1) of '596 application. The images generated by Go thus are 1-D Haar wavelet representations of the image in the vertical and horizontal directions.)

It is desirable to be flexible in processing image for facial recognition. Because 1-D Haar wavelet operation is one of edge determining processes, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to include 1-D Haar wavelet operation to generate Yang's edge maps as part of feature vector because this combination provides process flexibility.

The combination thus teaches:

-- calculating 1-D Haar wavelet representation and amplitude projections of an image;

-- combining said image with said I-D Haar representation and said amplitude projections.

Yang further teaches in the method the following features:

-- wherein said combining includes forming the discriminating feature analysis (DFA) vector of said image; (right column, page 43; The feature vector is normalized and presented with respect to the mean image. The vector is thus a DFA vector.)

-- wherein said DFA is formed based upon training images; (section 2.4.2; the learning process being inherently based on training images)

-- wherein said DFA's from said training images are used to model face and non face classes using a single multivariate probability distribution function (PDF) for each of said face classes; (left column, page 43 teaching two types of image, a face and a nonface; section 2.4.2 from right column, page 43 to left column, page 44 teaching the Gaussian PDF)

-- wherein said models are stored and used for later analysis of input images; (right column, page 43; Comparison is made between an input image and the prototype clusters. The prototype clusters are the models.)

-- calculating the DFA of an input image to be analyzed; (right column, page 43; Comparison is made between an input image and the prototype clusters. The DFA of the input image has to be calculated before the comparison.)

-- using said DFA's of said input image to classify the image using a Bayesian classifier. (section 2.4, left column, page 43)

Conclusion

11.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wenpeng Chen whose telephone number is 703 306-2796. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K Moore can be reached on 703 308-7452. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9306 for After Final communications. TC 2600's customer service number is 703-306-0377.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 305-4700.

Wenpeng Chen
Primary Examiner
Art Unit 2624

August 17, 2004